Space Science Board

Committee - 11. Biological Sciences

I. Many of us have been urging for sometime that exobiology should not only be the prime concern in the biological part of NASA's program, but is in many respects potentially the most important scientific question at stake in the whole space program.

Pittendrigh went so far in two lectures last spring as to suggest that the biological exploration of Mars should be identified, with Presidential authority, as a National goal of as least equal importance to the manned lunar landings.

On the other hand, as you know, the actual growth of the exobiology effort has been slow and frustrated by repeated re-estimates downwards of the payloads we can contemplate for Mariner etc.

It seems to some of us that the time is ripe for a renewed examination of the state of the exobiology effort, and, provided we are agreed on some fundamentals, a renewed effort to get the program into its proper perspective Nationally and into higher gear practically.

Some points we need urgently to reconsider are as follows:

1. Are we still agreed on our former estimates that the exobiology program should be

   i) the prime concern in the Biosciences Program?

   ii) so important as to merit being identified as a major National goal, co-equal (at least) with Apollo?

There is some evidence that Mr. Webb would be sympathetic to the idea of i) ii) above. But before we set in motion the appropriate pressures to this end we need solid agreement that our enthusiasm is not outstripping our judgment.

2. How do recent findings on the H_2O content and the extent of the atmosphere on Mars affect our earlier judgments that failure in the exploration for life on Mars is not a foregone conclusion?

3. Are we prepared, not only in principle, but in practical fact to defend our position publicly against critics like Abelson and (I suspect) George Wald?

If the answer to these questions is favorable - meaning that we still hold earlier news and are prepared to stand up and be counted in a public debate - we must begin with the unpleasant job of writing one or more carefully prepared documents. These documents would form the basis of an organized effort by the Academy's Space Science Board to bring about the needed changes of emphasis and, organization, etc. in the National program.

II. One such document might be a relatively brief statement of conviction; of broadly stated concrete aims; and of recommendation that the exploration of Mars be established, with highest authority as a National goal. Such a document would be a policy position paper giving the Board a basis for the necessary "political activity". You may comment that such a paper would contain nothing we have not said before. However, some things have to be said more than once and the fact is that the general climate of opinion on the Space program generally has undergone some substantial shakeups in the last six months in particular.

There is, first, the now widespread skepticism about its worthwhileness; a skepticism that was given explicit form and considerable impetus by Abelson's

editoral and testimony to the Senate.

Second, there is an associated, more widespread questionary going on about Federal science expenditures in general.

Third, there is the on-again, off-again Russian attitude to the whole space contest that has, at least, shaken to some extent the previously unquestioned assumption that we could not avoid a major program because of prestige considerations.

Fourth, there is the change in Presidency to consider. President Johnson is of course known to be a space enthusiast; but it may well turn out that his enthusiasm is principally for the Houston effort and the politically appealing spectaculars of man-spaced flight.

Altogether it seems to me that enough has been shaken up to justify the trouble of our reviewing our statement of biological priorities. For there is little doubt that NASA itself is going through a soul-searching in priorities; and now is the time to strike.

Much of the criticism of the Space Program that is hard to rebut concerns the relatively small amount of real science involved. I believe we can exploit that criticism in attempting to get the biological exploration of Mars upgraded in the total program.

I suggest that if we go ahead and produce the position paper on policy it be circulated to as many outstanding workers as possible for signature. These could and should include physicists like Morrison and Dyson who I believe would agree.

III. A second document is needed for other purposes. It is needed as a basis for public defense of our position in debate with professionals who disagree. And it is needed as a basis for more detailed and concrete planning in NASA than the

position paper to Mr. Webb would permit.

The contents of that document are something the Palo Alto meeting must take a first crack at outlining. Thus I have in mind in suggesting it include:

1) A sober evaluation of aims and possible outcomes. The value of the information obtained even if negative results in life detection are obtained.

2) Some indications of strategy for the program as a whole. The relative importance of fly-bys, soft landings. How information from fly bys could modify planning for the landers.

3) Comment on the uniqueness of the opportunity in this decade. How this should, or should not, affect strategy and priorities. Should we risk a crash program for this opportunity or wait the 14 years for the next.

This is a really difficult one. Speed, haste, etc. are among the most widely criticized features of the program. Would we gain by advocating this haste and a better attack in the late 1970's? Or is the long delay to risky in the face on the capricious behavior of Congress etc.?

Lederberg and Levinthal have I believe been preparing some substantial review of the whole situation. That review might be all we need; and certainly it is going to help enormously. But in the long run we shall need a document that includes not only the purely scientific considerations their paper will cover but some statement of coherent plan of attack including recommendations on priorities and procedures to NASA

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